

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
CHECK VALVE ASSEMBLY, ITEM 128 ----- SV767699-1 (1)	2/2	128FM02 Fails to open, reduced flow area. Flapper stuck to seat due to contamination.	END ITEM: Blockage of water flow path through valve. GFE INTERFACE: Loss of coolant loop flow. Loss of LCVG cooling. Vent cooling still available. MISSION: Terminate EVA if cooling is insufficient. CREW/VEHICLE: None. Crew discomfort. (hot) TIME TO EFFECT /ACTIONS: Minutes. TIME AVAILABLE: N/A TIME REQUIRED: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - Check valve is a rubber flapper design with no spring. The flapper has a large inner surface exposed to opening pressure. B. Test - Component Acceptance Test - A performance test is run per AT-E-127/128 in which the check valve must flow a minimum of 260 lbs/hr H2O at a max. pressure drop of 0.15 psid. PDA Test - Proper function of the check valve is also verified during the coolant loop dry charge test. Starting with an empty cooling circuit, the PLSS water pump must be capable of filling the cooling circuit and remove all gas bubbles within 10 minutes of starting the pump. A failed closed check valve would prevent the pump from priming properly. Certification Test - Certified for a useful life of 25 years (ref. EMUM1-0023). C. Inspection - Cause - Flapper stuck to housing due to contamination. A cleanliness level of HS3150 EM150 is maintained during assembly and testing of the check valve. This cleanliness level requires a mandatory inspection for verification. D. Failure History - H-EMU-128-D004 (9/22/89). The Item 127/128 check valve assembly failed pressure drop requirements during Acceptance testing due to a stiff rubber diaphragm check valve which required a greater than normal pressure differential for the rated flow. EC 163402-423 adds an in-process test to the check valve Assembly Drawing, SV767699, Flag Note #3 to implement a pressure drop test for screening discrepant rubber diaphragm check valves during the valve assembly process. H-EMU-128-D005 (3/3/92) - The item 128 check valve assembly failed pressure drop requirements (Act: 5.1 inches of water at 260 lbs/hr; Spec: 4.15 inches of water max). Investigation revealed that the valve orientation in the test fixture positioned the valve outlet 0.5 inches higher in elevation than the inlet causing an additional 1.1 inch H2O pressure differential. The test fixture orientation will be controlled to insure equal elevation of valve inlet and outlet during future testing. E. Ground Turnaround - Tested for non-EET processing per FEMU-R-001, Fan/Pump/Separator/Vent Flow Sensor Performance. None for EET processing. F. Operational Use - Operation Effects - Crew Response - PreEVA: Trouble shoot problem. If no success, consider third EMU if available. Continue with EVA prep. EVA: If cooling becomes a problem, diminish level of activity and try to stay away from direct sunlight. If cooling is still inadequate, terminate EVA. Training -

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		128FM02		Standard training covers this failure mode. Operational Considerations - RTDS allows ground monitoring of EMU systems. EVA check list procedures verify hardware integrity and systems operational status prior to EVA. Flight rules define loss of EVA for loss of thermal control.

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-128 CHECK VALVE AND HOUSING
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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